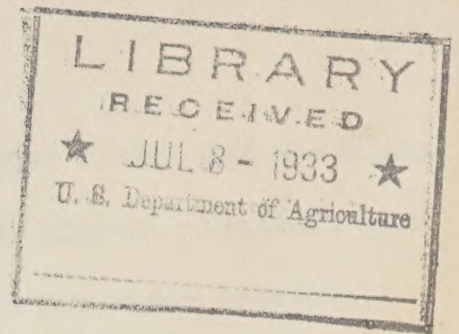


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SUGAR CANE INSECTS IN 1924

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The year 1924 was marked by a very extraordinary increase of interest among the Louisiana sugar planters in agricultural work. Most of them had previously devoted themselves to their sugar factories and the "selling end" almost to the exclusion of the fields. The foremost of them, however, now realize that -- to quote the seal of the U. S. Department of Agriculture -- "Agriculture is the Foundation of Manufacture and Commerce."

Without considering the causes of this change of view, it is interesting to note the reaction on agricultural experimentors and especially on the work of this, the Sugar Cane Insect Laboratory. It is probable that every person connected with experimental work in southern Louisiana was impressed and heartened at the evidence of the new enthusiasm on the part of sugar planters for things pertaining to good agriculture. As for this laboratory, we devoted some time in the early part of the year toward writing a rather elaborate report which showed that practically all that we could do toward solving the borer problem had been done, and that there remained only some odds and ends of investigations in which little hope could be placed. The opportunity was even taken to present the whole history and accomplishments of the laboratory to an eminent entomologist -- Prof. Herbert Osborn, of Ohio State University, who, as previously reported in the sugar journals (1) * could find nothing to criticize.

* The numbers in parentheses refer to publications cited.

With the increase of interest in agricultural work on the part of the sugar planters, however, the whole outlook was suddenly changed. Ideas which had formerly been ignored and finally almost forgotten were now received with a new appreciation which literally almost took the experiment station men off their feet. Suggestions which were once condemned as impossible were now regarded as practicable, and in some cases planters went further than the investigators in resolving to conduct experiments which would not have been considered for a moment a year ago.

In regard to the cane borer, to get down to a specific case, the new ideas as to what can and what cannot be done on plantations place the whole subject in a very different light. With our present knowledge we think that the control of the borer on sugar plantations is well in sight, and that it largely depends on whether the planters are willing to treat their seed cane so as to obtain borer free seed for planting. While we may be mistaken, in the absence of an experiment on such scale as to test our ideas, we believe that borer damage comes largely from

planted seed cane, the borers passing the winter in the planted stalks and the moths emerging in the spring and depositing their eggs on the young plants. Planters now have two methods of destroying borers in the seed cane -- the hot water treatment and the cold water treatment. Both are being ~~tried~~^{tested} this year on a rather large scale.

The Hot Water Treatment.

Much has been written about the hot water treatment of sugar cane. Several planters expected to try it this fall, but we believe that only one finally did so. We are informed that enough cane to plant two and a half acres was treated with hot water^{at} Southdown Plantation during December.

Briefly, seed cane is soaked for 20 minutes in water heated to 122 degrees Fahrenheit. All insect life is destroyed and the germination of the cane is hastened. On badly sprouted, windrowed cane treated in the spring, however, the sprouted eyes were killed. As is well known, the treatment was first suggested by Dr. E. W. Brandes of the Bureau of Plant Industry.

The Cold Water Treatment.

Shortly after first trying the hot water treatment in 1922, the writers tried soaking seed cane in cold water for much longer periods. It was found that an immersion of 24 hours killed most of the borers in the stalks, and that an immersion of 72 hours killed all of them. The germination of the cane was unaffected, unless it was stimulated. A treatment occupying such a long time was regarded as impracticable, but in 1923 an immersion for 72 hours was recommended by Cleare (2) in British Guiana. In their mimeographed circular (3) issued in May, 1924, the writers ventured to recommend a flooding of planted fields for from 24 to 72 hours, and more recently, in response to the increased interest on the part of sugar planters, they have suggested to individual planters than an immersion of from 24 to 72 hours be tried.

Mr. E. A. Pharr, at Avoca Plantation, has given the treatment a thorough trial. At first he soaked a few pieces of seed cane which he planted in his garden and finding that the borers were killed and the germination unharmed he planned to treat seed cane on a much larger scale. Five barges were moored at convenient points in the bayous which surround Avoca Plantation. The procedure was to fill a barge with cane tied up with chains in wagon-load lots, and then to pump the barge full of water, letting it stand for 72 hours. With the number of barges used the planting was not delayed. Soon after the case was submerged the surface of the water would be found covered with borers in the worm, pupa and even the moth stage. After 72 hours the water was pumped out, and the cane raised and loaded on wagons

and planted. The bottom of the barge would be found covered with dead borers.

From one barge the cane was taken after 65 hours, and though the water had driven the borers out of the cane some of them were still alive and when the water was removed they crawled back into the stalks.

Mr. Pharr estimates that as the treatment means a saving of seed, no allowance being made for planting seed which will be ruined by borers, the expense of the operation is nothing at all. Enough seed cane was treated to plant about 70 acres. The writers saw the fields in the middle of December, and the stand of the treated seed was much better than that of the untreated seed. The treated cane already had a good root system.

The attitude of some other planters to this work is worthy of comment. It is pointed out by them that Avoca Plantation is situated in a most favorable situation, being surrounded by wide bayous, and that Mr. Pharr has a special type of barge which can be filled with water. Barges used at some other places are flat on top and the cane is held by a railing or fence around the sides.

Plenty of water, however, is available everywhere, all the plantations in southern Louisiana fronting on a river or a bayou, and it would be a comparatively simple matter either to obtain the right type of barge or to construct tanks on the plantation. The borer causes a very great loss every year, and if the damage from it can be reduced materially it would seem that some expense the first year in providing for barges or tanks would be fully justified. To control the boll weevil the cotton planter must provide special machines and poison dust, and even work during the night to apply the dust. Peach and orange growers have to spray their trees, using costly machines and material. It would seem that a matter of obtaining a few barges/^{or tanks}would not be an insurmountable obstacle to sugar planters who wish to lessen the damage from the borer, which amounts to thousands of dollars each year.

Estimate of Borer Damage.

In January, 1924, the writers, in cooperation with Mr. L.L. Janes of the Bureau of Agricultural Economics, estimated the total annual damage due to the cane borer. Mr. Janes sent questionnaires to planters and made his estimate from their replies. Working independently, we estimated from our own field observations. The two estimates were very close, agreeing within about one per cent. The estimated loss for 1923 was 23% of a normal crop, for 1922 17%, with an average loss of 19%. While we had already (4) published similar figures, the fact that two different offices of the Department of Agriculture, working independently, had arrived at practically the same results impressed many who had doubtless disbelieved or overlooked the earlier publication.

The estimated losses were used effectively by the American Sugar Cane League in awakening planters to the serious conditions menacing their industry.

Two Recommendations.

During the spring and summer at least the most prominent of the planters became alive to the fact that on account of low yields they must look to improved agricultural practices to put the Louisiana sugar industry on its feet.

At a meeting of a number of planters at Southdown Plantation on June 3rd, Dr. R. D. Rands of the Bureau of Plant Industry and the senior writer of this article decided that the two recommendations which would best help the planters, in so far as the borer and general agriculture were concerned, were that no corn be planted, or at least that corn be grown as far as possible from sugar cane (corn being the favorite food plant of the borer), and that the cane trash be not burned but plowed under in a special way. Dr. Rands had noticed that where the trash had been turned under the soil was in an open, friable condition, and we (4) had found that on the whole there are fewer borers where the trash is not burned. The latter is undoubtedly due to the conservation of the native parasite of the cane borer.

These recommendations have been endorsed by the American Sugar Cane League, and the writers are informed that the plowing under of trash is general, at least in some communities. The practise of planting no corn will be tried on two or more plantations.

At this point it should be mentioned that looking back through the literature we find that temporary curtailment of corn planting was given as a remedy by Stubbs and Morgan (5) in 1902. They write, "planters recall that the vigorous attack of the borer on cane has invariably lessened when the operations of the plantation forced less acreage of the corn crop, or where the growing of corn was abandoned for a year or more."

It is worth repeating here that corn greatly increases the number of cane borers, that it takes from the soil the same plant food substances and is therefore not a good plant for rotation, and that it harbors the corn louse, which is the only known carrier of sugar cane mosaic disease.

It is believed that no sugar country except Louisiana attempts to grow corn in connection with sugar cane.

It may be hard to replace corn with another crop, but the suggestion recently made by Mr. Geo. A. Hero (6) that the corn plants be cut and dehydrated early in the season (before many borers have emerged from them) may help to solve the problem. Some planters have tried soy beans and peanuts as a substitute for corn.

Extensive Field Examinations.

The month of December saw the completion of the field examinations which we make annually. With four men this year we were able to do more work than usual. The borer infestation was found to be less than last year, and an estimate of the loss will be made later in cooperation with Mr. Janes. The cold weather in January, 1924, was found to have killed borers in exposed pieces of cane, and it may be that the drought of the summer and fall had something to do with the lower infestation.

Either owing to weather conditions or to fewer borers, the Cuban tachinid parasite and even the native egg parasite were found to be very scarce.

In connection with our field work we were often able to render a sort of consulting service to planters which seemed to be appreciated. The value of this service depended largely on the eagerness of the planter for the information which we could give him. Whenever a planter was found who was anxious for our assistance we made a special effort to give him as much time as we could. It was intended at first to visit practically all the plantations, but this was found impossible, and plantations where Cuban parasites had been released were visited besides those planters who by correspondence or otherwise had shown their interest in the work.

Wireworm Investigations.

With Mr. W. E. Anderson, Louisiana State Entomologist, the senior writer went to Avoca Plantation during June to investigate a report of injury to sugar cane by wireworms, the young of click or snapping beetles. About 250 acres of plant cane were found to be seriously damaged, as well as about 50 acres of stubble. The insects work below the surface of the ground, making short tunnels into the plants, especially the eyes of planted stalks, in a manner somewhat similar to the cane borer.

Little information on control could be obtained, and some experiments toward controlling the wireworms were started. Nothing was successful except a very prolonged flooding, but it was necessary to leave the water on the field so long that the cane itself was killed. However, this is something worth knowing, as the method might be effectively applied elsewhere than on fields of growing cane. The infestation is limited to the one plantation, but if the damage should occur generally the matter would be serious. Recent information from Avoca Plantation is that the wireworms was responsible for a reduction in the yield of cane of about 15 tons per acre in the fields badly infested. The actual yield was about 10 tons per acre from land which should have given 25 tons.

The Pink Borer.

For two years this laboratory, in cooperation with Mr. E.K. Bynum of the Mississippi Plant Board, has studied a pink larva which borers in sugar cane, principally in the vicinity of Gulfport, Miss. This insect turned out to be new, and has

been named Macroleon cosmion by Dr. H. G. Dyar of the U. S. National Museum. After a study of its habits and life history we have decided that it is not a pest to be feared, and that it is probably a native insect of grasses and only occasionally attacks sugar cane.

The Mealybug in Southern Georgia.

The sugar cane mealybug was reported from southern Georgia in 1922. An investigation was immediately undertaken by this laboratory, the infestation was mapped out, and control measures were recommended. A card was printed giving the control measures and means of avoiding spread, and through the cooperation of the local postmasters a copy was placed in every rural mail box in the infested area. It is now gratifying to know that these recommendations have been largely adopted with success. We have carried on experiments which indicate that further control may be obtained by the use of Argentine ant poison in the fields, even though the ants are of several native species. As the development of the mealybug depends on ants, the reduction in the numbers of ants reacts on the mealybug. Mr. J. W. Ingram, of this Bureau, had charge of the work of placing out cans of ant poison and locating the experiments.

Cooperation with Tropical Plant Research Foundation.

As has already been announced, this laboratory was recently visited by Messrs. D. L. Van Dine and C. F. Stahl, who arranged to cooperate with us on sugar cane insect studies. The Tropical Plant Research Foundation is an organization of scientific standing which will undertake the investigation of tropical crop problems. At present it is starting an investigation of sugar problems in Cuba, being supported for this work by the Cuba Sugar Club. It is hoped that our connection with the Foundation will be mutually beneficial.

A Plan for the Future.

To obtain more accurate results in borer control experiments, we have in mind the operation of a small farm or plantation isolated from other plantings of sugar cane and corn. Control experiments could be tried at such a place without the danger of the cane being infested by moths flying in from adjoining fields. This plan has the support of the American Sugar Cane League.

Publications Cited.

(1) Holloway, T.E.

1924. Letter to editors of sugar journals. In Facts About Sugar, June 28, Louisiana Planter, June 28, Sugar, July.

(2) Cleare, L. D., Jr.

1923, Notes on the Small Moth-Borers of Sugar-Cane in British Guiana. In Bulletin of Entomological Research, April, 1923.

- (3) Holloway, T. E., and Haley, W. E.
1924. Suggestions for the Control of the Sugar Cane Moth Borer. Mimeographed circular, May. Printed in Facts About Sugar, May 3, Louisiana Planter, May 3, Sugar, May.
- (4) Holloway, T. E., and Loftin, U. C.
1919. The Sugar Cane Moth Borer. U. S. D. A. Bul. 746.
- (5) Stubbs, W. C., and Morgan, H. A.
1902. Cane Borer. Bul. Agr. Expt. Sta., Baton Rouge, Second Series, No. 70.
- (6) Hero, Geo. A.
1924. Dehydration on Sugar Plantations.
(Letter to Louisiana Planter). In Louisiana Planter, Nov. 22.
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